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FAX TRANSMISSION

Date: November 26, 2008
To: Examiner G. Koch GAU 1791 U.S. Patent and Trademark Office
Fax: 571-273-8300
From: William J. Clemens
Re: 16129

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Effective on 12/08/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818). FEE TRANSMITTAL For FY 2009		Complete if Known	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		Application Number	10/691,763
		Filing Date	October 23, 2003
		First Named Inventor	Clifford
		Examiner Name	G. Koch
		Art Unit	1791
TOTAL AMOUNT OF PAYMENT (\$) 540.00		Attorney Docket No.	16129

METHOD OF PAYMENT (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES							
Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	330	165	540	270	220	110	
Design	220	110	100	50	140	70	
Plant	220	110	330	165	170	85	
Reissue	330	165	540	270	650	325	
Provisional	220	110	0	0	0	0	
2. EXCESS CLAIM FEES							
Fee Description						Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)						52	26
Each independent claim over 3 (including Reissues)						220	110
Multiple dependent claims						390	195
Total Claims		Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims		
- 20 or HP =		x	=		Fee (\$) Fee Paid (\$)		
HP = Highest number of total claims paid for, if greater than 20.							
Indep. Claims		Extra Claims	Fee (\$)	Fee Paid (\$)			
- 3 or HP =		x	=				
HP = Highest number of independent claims paid for, if greater than 3.							
3. APPLICATION SIZE FEE							
If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)			
- 100 =	/ 50 =	(round up to a whole number) x	=				
4. OTHER FEE(S)							
Non-English Specification, \$130 fee (no small entity discount)				Fees Paid (\$)			
Other (e.g., late filing surcharge): Appeal Brief				540			

SUBMITTED BY		
Signature	Registration No. 26,855 (Attorney/Agent)	Telephone 248-960-2100
Name (Print/Type): William J. Clemens	Date November 26, 2008	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: CLIFFORD et al.)	Confirmation No.: 6713
)	
Serial No.: 10/691,763)	Examiner: G. KOCH
)	
Filed: October 23, 2003)	Group Art Unit: 1791
)	
For: <u>MODULAR PAINTING APPARATUS</u>)	<u>Attorney Docket: 16129</u>

BRIEF ON APPEAL

(i) *Real Party in Interest:*

The real party in interest is FANUC ROBOTICS AMERICA, INC., the assignee of record.

(ii) *Related Appeals and Interferences:*

Applicants are not aware of any related appeals or interferences.

(iii) *Status of Claims:*

Claims 1-60 are cancelled.

Claims 61-101 are rejected.

Claims 102-151 are withdrawn from consideration.

The claims on appeal are 61-101. A copy of the claims on file is submitted in the attached Claims Appendix.

(iv) *Status of amendments:*

There are no amendments pending in the application.

(v) *Summary of claimed subject matter:*

The invention sought to be patented relates to a modular apparatus for processing (such as by painting) an article (such as surfaces of a vehicle body) moved along a path. The modular apparatus includes two guide/frame rails and at least one robot located on

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and movable along the length of each of the two guide rails. The guide rails are elevated above the article on opposite sides of the path. The guide rails are part of a rigid frame structure that prevents movement of one of guide rails relative to another of the guide rails.

The novel modular apparatus for painting surface of a vehicle body moved along a path as set forth in independent Claim 61 comprises:

- a) a modular apparatus (Specification at page 4, lines 19-22, and page 5, lines 25-26; Figs. 1 and 6, reference numerals 10 and 20) including two guide rails;
and
- b) at least one robot (Specification at page 5, lines 2-4, and page 6, lines 6-7; Figs. 1, 2 and 6, reference numeral 16) located on and movable along the length of each of the two guide rails;
- c) the guide rails comprising a pair of frame rails (Specification at page 4, lines 21-24, and page 6, lines 1-5; Figs. 1, 3, 4 and 6, reference numeral 11) located on opposite sides of and extending generally parallel to the path of movement of the vehicle body, the frame rails being located above a plane of an upper surface of the vehicle body (Specification at page 9, lines 7-11; Fig. 6, reference numerals body 43 and upper surface 44) as the vehicle body travels the path, the frame rails being fixedly mounted on a rigid frame structure that prevents movement of one of the frame rails relative to another of the frame rails (Specification at page 4, lines 26-32, and page 6, lines 1-5);
- d) the at least one robot comprising a first and a second robot arm (Specification at page 8, lines 8-11; Fig. 5, reference numerals first arm 32 and second arm 35) mounted on an associated one of each of the frame rails, each of the first and second robot arms being slidably movable along the associated frame rail and having a shoulder axis (Specification at page 8, lines 8-9, Fig. 6, reference numeral 34) and an elbow axis (Specification at page 8, lines 9-11, Fig. 6, reference numeral 36) for movement only in a generally vertical plane transverse to the path of movement of the vehicle body (Specification at page 8, lines 15-16, and page 9, lines 29-30), the

shoulder axes being positioned below the associated frame rail (Preliminary Amendment filed May 26, 2006 at page 3; Fig. 6, reference numerals frame rail 11 and shoulder axis 34); and

- e) a paint applicator (Specification at page 5, lines 3-4; Figs. 1, 2, 5 and 6, reference numeral 17) mounted on each of the first and second robot arms for dispensing paint whereby each of the first and second robot arms is sized to move the paint applicator relative to the vehicle body while the paint applicators dispense paint to cover the upper surface and adjacent side surfaces of the vehicle body with the paint (Specification at page 9, lines 11-14).

Dependent Claim 69 recites a control means (Specification at page 9, lines 14-18; Figs. 5 and 6, reference numeral 46 designating the process controller).

The novel modular apparatus for painting a vehicle body having an upper surface and opposed side surfaces and being conveyed along a path as set forth in independent Claim 72 comprises:

- a) the modular apparatus including robots, frame rails and paint applicators as referenced in Claim 61;
- b) at least two legs (Specification at page 4, lines 24-26, and page 9, lines 8-11; Figs. 1, 3, 4 and 6, reference numeral 13) attached to each said frame rail for supporting said frame rails above a plane of the upper surface of the vehicle body on the path (Specification at page 5, lines 13-17); and
- c) at least one cross member (Specification at page 4, lines 26-28; Figs. 1, 3, 4 and 6, reference numeral 14) fixedly connecting said frame rails together as a rigid frame structure that prevents movement of said frame rails, fixes said frame rails relative to one another and to said plane, and minimizes a width of said rigid frame structure relative to a width of the vehicle body (Specification at page 7, lines 16-19).

The novel modular apparatus for painting surfaces of a vehicle body moved along a path through a paint booth as set forth in independent Claim 81 comprises:

- a) the modular apparatus including robots, frame rails and paint applicators as referenced in Claim 61;

- b) at least one robot arm including a controller mounted on said rail for travelling along said rail (Specification at page 9, lines 14-18; Figs. 5 and 6, reference numeral controller 46); and
- c) wherein said control means is connected to each of said first and second robot arms for selectively dispensing the paint in a normal mode wherein different areas of the upper surface and the adjacent side surface are covered by said paint applicators of each of said first and second robot arms and a degraded mode wherein the upper surface and the adjacent side surface are covered by said paint applicator of one of said first and second robot arms (Specification at page 9, lines 11-14, and page 10, lines 3-5).

The novel modular apparatus for painting surfaces of a vehicle body moved along a path as set forth in independent Claim 90 comprises:

- a) the modular apparatus including robots, frame rails and paint applicators as referenced in Claim 61; and
- b) a first and a second robot arm mounted on an associated one of each of said frame rails, each of said first and second robot arms having a carriage (Specification at page 5, lines 1-3; Figs. 1, 2 and 6, reference numeral mounting base 15) movable along an associated one of said frame rails, first and second arm links (Specification at page 8, lines 8-11; Figs. 5 and 6, reference numerals first link 32 and second link 35), and mounting means (Specification at page 8, lines 11-12; Figs. 5 and 6, reference numeral wrist 37) for mounting a paint applicator at an end of said second arm link, three parallel axes of movement including a first linear axis (Specification at page 8, lines 16-19; Fig. 5, reference numeral rail axis 40) wherein said carriages move along said associated frame rails, a second rotational axis (Specification at page 8, lines 8-9; Figs. 5 and 6, reference numeral shoulder axis 34) located below said first linear axis for rotating said first arm link relative to said carriage and a third rotational axis (Specification at page 8, lines 9-11; Figs. 5 and 6, reference numeral elbow axis 36) spatially separated from said second rotational axis by said first arm link for rotating said second arm link relative to said first arm

link whereby movement of a paint applicator attached to said mounting means is restricted to a generally vertical plane transverse to the path of movement of the vehicle body and movement along the path of movement of the vehicle body (Specification at page 8, lines 15-16).

The novel modular apparatus for processing an article moved along a path as set forth in independent Claim 91 comprises:

- a) the modular apparatus including robots and frame rails as referenced in Claim 61;
- b) the robot including a control system (Specification at page 9, lines 14-18, and page 10, lines 1-2; Figs. 5 and 6, reference numeral controller 46);
- c) the robot having six axes of motion and being connected to said control system for controlling movement of said robot, said modular system having a frame structure including first and second linear and parallel guide rails (Specification at page 4, lines 21-23; Figs. 1 and 6, reference numeral frame rail 11), a first carriage supported on said first guide rail and movable along a first of said six axes and a second carriage supported on said second guide rail and movable along a second of said six axes (Specification at page 5, line 1; Figs 1 and 6, reference numeral base 15), a first arm link rotationally coupled at one end to said first carriage at a third of said six axes and rotationally coupled at another end to a second arm link at a fourth of said six axes (Specification at page 8, lines 8-11; Figs. 5 and 6, reference numerals first link 32, third axis 34, second link 35 and fourth 36), a third arm link rotationally coupled at one end to said second carriage at a fifth of said six axes and rotationally coupled at another end to a fourth arm link at a sixth of said six axes (Specification at page 8, lines 8-11; Figs. 5 and 6, reference numerals third link 32, fifth axis 34, fourth link 35 and sixth axis 36), and process tool mounting means (Specification at page 8, line 11-12; Figs. 5 and 6, reference numeral wrist 37) supported at terminal ends of said second and fourth arm links, wherein said first and second guide rails are elevated above the article on opposite sides of the path and said six axes are parallel to the path

(Specification at page 5, lines 13-17, and page 9, lines 8-11; Figs. 5 and 6).

The novel robot for processing an article moved along a path as set forth in independent Claim 98 comprises:

- a) the robots, guide rails, control system and carriages as referenced in Claim 91;
- b) a first link mechanism rotationally coupled to said first carriage at a third axis (Specification at page 8, lines 6-11; Figs. 5 and 6; reference numerals first carriage 15, first link 32 and 35, and third axis 34);
- a second link mechanism rotationally coupled to said second carriage at a fourth axis (Specification at page 8, lines 6-11; Figs. 5 and 6; reference numerals second carriage 15, second link 32 and 35, and fourth axis 34); and
- a process tool mounting means (Specification at page 8, lines 11-14; Figs. 5 and 6, reference numeral 37 identifying a wrist) supported at terminal ends of said first and second link mechanisms, wherein said guide rails are fixed and said modular system is elevated above the article on opposite sides of the path (Specification at page 5, lines 13-17, and page 9, lines 8-11; Figs. 5 and 6).

(vi) *Grounds of Rejection to be Reviewed on Appeal:*

1. The rejection of Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87, 89-92, 94-95 and 98-101 under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and either or both of Nuber (DE 101 19 906 A1) and/or Pearce (US 4,781,517)
2. The rejection of Claims 74, 83 and 97 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Nuber and/or Pearce as applied to Claims 72, 81 and 91 above, and further in view of Thome (US Patent 5,744,190).
3. The rejection of Claims 75, 88 and 96 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to Claims 72, 81 and 91 above, and further in view of Cebola (US Patent 5,738,727).

4. The rejection of Claim 76 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thorne as applied to Claims 75 and 52 [sic] above, and further in view of Neikter (US Patent 5,296,026).

5. The rejection of Claims 64 and 85 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 81 above, and further in view of Josefsson (US Patent 5,766,355).

6. The rejection of Claims 66 and 68 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 67 above, and further in view of Cebola (US Patent 5,738,727).

7. The rejection of Claims 62, 84 and 93 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 81 above, and further in view of Hohn et al (US Patent 4,896,274).

(vii) *Argument:*

The rejection of Claims 61-101 under 35 U.S.C. 103(a) based upon Nuber:

In the Final Office Action (FOA), dated June 30, 2008, the Examiner relies on Nuber (Nüßer DE 101 19 906 A1) to support the rejection under 35 U.S.C. 103(a) of all of Applicant's independent Claims 61, 72, 81, 90, 91 and 98. Nuber has a publication date of October 24, 2002. Applicant claims priority to Provisional Application Serial No. 60/420,612 filed on October 23, 2002. Therefore, Nuber is not prior art.

The Examiner rejected Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87, 89-92, 94-95 and 98-101 under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and either or both of Nuber and/or Pearce (US 4,781,517). (FOA at page 3) While Nuber and Pearce were cited as being interchangeable, the Examiner relies solely on Nuber (FOA at page 5) for disclosing a paint spraying six-axis robot including a fixed frame rail, fixed cross beams and the robot having a shoulder, elbow and wrist below the auxiliary axis and racks permitting movement only in a generally vertical plane (Fig. 3). Additionally, the Examiner relies solely on Nuber to obviate raising the frame and lowering the robot below this frame to improve access to the top surface of the substrate, and in the automobile field, improve coating of the roof of the car (FOA at page 5).

Applicant's Provisional Application Serial No. 60/420,612 shows a paint spraying six-axis robot system (two robots) including fixed frame rails, fixed cross beams and the robots having a shoulder, elbow and wrist below the frame rail and permitting movement only in a generally vertical plane. (Provisional Specification at page 1, line 29, through page 2, line 23, and photographs on page 50; Figs. 1 and 2) Therefore, as set forth above, Nuber is not prior art.

The rejection of Claims 61, 63, 65, 67, 69-73, 77, 79-82, 86, 87, 89-92, 94-95, and 98-101 under 35 U.S.C. 103(a):

The Examiner rejected these claims as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and either or both of Nuber (DE 101 19 906 A1) and/or Pearce (US 4,781,517). (FOA at page 3)

Claims 61, 63, 65, 67 and 69-71:

Applicant's independent Claim 61 recites "each of said first and second robot arms being slidably movable along said associated frame rail and having a shoulder axis and an elbow axis for movement only in a generally vertical plane transverse to the path of movement of the vehicle body, said shoulder axes being positioned below said associated frame rail". The Examiner stated that "Similarly, Nuber discloses that the shoulder and elbow permit movement only in a generally vertical plane from the position of the joints in Figure 3." (FOA at page 6) However, Nuber is not prior art, and Takeo, Yamamoto and Pearce do not show shoulder axes positioned below the associated frame as recited in Applicant's independent Claim 61 and dependent Claims 62-71.

Takeo shows an apparatus for painting the inner panel portions of vehicle body front and rear lids and doors using front and rear painting robots. The Takeo apparatus moves a vehicle body W to a painting stage A positioned between first and second railway means 11 mounted on a floor at the painting stage A. The rails 11 are positioned well below the bottom of the vehicle body W, as seen in Fig. 2, as are tables 12₁, 12₂ movable along the rails and carrying robots 5₁, 5₂ respectively. Takeo does not show frame rails located above a plane of an upper surface of the vehicle body, or the frame rails fixedly mounted on a rigid frame structure, or robot arms having shoulder axes positioned below the associated frame rails as recited in Applicant's Claim 61.

Yamamoto shows, in Figs. 15 and 16 referenced by the Examiner, an overhead painting apparatus 500 that has floor mounted rails 518a, 518b positioned on opposite sides of a path of travel of a vehicle body 522. The vertical posts 38 move along the rails 518a, 518b and support opposite ends of an overhead painting mechanism 520 that has a plurality of paint spray guns 574a through 574i mounted on a horizontal arm 572. Contrary to the Examiner's assertion that Yamamoto discloses in Fig. 15 that it is known to elevate painting robots (FOA at page 4), the overhead arm 572 is not a robot arm as is known to one of ordinary skill in the art. Furthermore, raising the Takeo rails and robots above the vehicle results in an inoperative system. As shown Takeo Fig. 2, when the rail 11 is elevated above the upper surface of the vehicle body the arm 5c cannot rotate downward past the base 5a in order for the arm 5d to paint the lower portions of the vehicle body.

Pearce shows, in Fig. 2 referenced by the Examiner, four vertical posts 13, 18, 19 and 20 supporting a frame 21 formed by two lateral members 22 attached to two transverse members 23. A bridge member 24 has opposite ends 43 movable supported on the transverse members 22. A robot carriage 71 is mounted for movement along the bridge member 43 transverse to the path of travel of a vehicle body 50. However, Pearce does not provide the missing robot arms having shoulder axes positioned below the associated frame rails as recited in Applicant's Claim 61.

Claims 72, 73, 77, 79 and 80:

Applicant's independent Claim 72 recites "said at least one robot comprising at least one robot arm located on an associated one of each of said frame rails, said at least one robot arm being movable along said associated frame rail generally parallel to the path and being pivoted at a shoulder axis positioned below said associated frame rail". As to Claim 72, the Examiner stated that Nuber Figure 3 shows that the robot has a shoulder, elbow, and wrist below the auxiliary axis and the racks, and from the position of the joints in Figure 3, both the shoulder and elbow permit movement only in a generally vertical plane. (FOA at page 5) As explained above, Nuber is not prior art, and Takeo, Yamamoto and Pearce do not show a shoulder axis positioned below the associated frame as recited in Applicant's independent Claim 72 and dependent Claims 73-80.

Claims 81, 82, 86, 87 and 89:

Applicant's independent Claim 81 recites "a first and a second robot arm mounted on an associated one of each of said frame rails, each of said first and second robot arms being movable along said associated frame rail and having a shoulder axis and an elbow axis for movement only in a generally vertical plane transverse to the path of movement of the vehicle body, said shoulder axes being positioned below said associated frame rail". The Examiner stated that "Nuber discloses that the shoulder and elbow permit movement only in a generally vertical plane from the position of the joints in Figure 3." (FOA at page 7) As explained above, Nuber is not prior art. Takeo, Yamamoto and Pearce do not show a shoulder axis positioned below the associated frame and the shoulder axis and an elbow axis for movement only in a vertical plane transverse to the path of movement of the vehicle body as recited in Applicant's independent Claim 81 and dependent Claims 82-89.

Claim 90:

Applicant's independent Claim 90 recites "a first linear axis wherein said carriages move along said associated frame rails, a second rotational axis located below said first linear axis for rotating said first arm link relative to said carriage and a third rotational axis spatially separated from said second rotational axis by said first arm link for rotating said second arm link relative to said first arm link whereby movement of a paint applicator attached to said mounting means is restricted to a generally vertical plane transverse to the path of movement of the vehicle body and movement along the path of movement of the vehicle body". The Examiner stated that Claim 90 is rejected based on the same rationale as Claims 61, 72 and 81. (FOA at page 8) As explained above, Nuber is not prior art. Takeo, Yamamoto and Pearce do not show a second rotational axis positioned below a first linear axis of the associated frame whereby movement of a paint applicator is restricted to a vertical plane transverse to the path of movement of the vehicle body as recited in Applicant's independent Claim 90.

Claims 91, 92, 94 and 95:

Applicant's independent Claim 91 recites "first and second linear and parallel guide rails, a first carriage supported on said first guide rail and movable along a first of said six axes and a second carriage supported on said second guide rail and movable

along a second of said six axes, a first arm link rotationally coupled at one end to said first carriage at a third of said six axes and rotationally coupled at another end to a second arm link at a fourth of said six axes, a third arm link rotationally coupled at one end to said second carriage at a fifth of said six axes and rotationally coupled at another end to a fourth arm link at a sixth of said six axes, and process tool mounting means supported at terminal ends of said second and fourth arm links, wherein said first and second guide rails are elevated above the article on opposite sides of the path and said six axes are parallel to the path." The Examiner stated that Claim 91 is rejected based on the same rationale as Claims 61, 72 and 81. (FOA at page 8) As explained above, Nuber is not prior art. Takeo, Yamamoto and Pearce do not show two elevated guide rails and six axes parallel to the path as recited in Applicant's independent Claim 91 and dependent Claims 92-97.

Claims 98-101:

Applicant's independent Claim 98 recites" wherein said guide rails are fixed and said modular system is elevated above the article on opposite sides of the path." The Examiner stated that Nuber and Pearce suggest fully elevating the robots. (FOA at page 8) As explained above, Nuber is not prior art. Takeo, Yamamoto and Pearce do not show fully elevating the rails and robots as recited in Applicant's independent Claim 98 and dependent Claims 99-101.

The rejection of Claims 74, 83 and 97 under 35 U.S.C. 103(a):

The Examiner rejected Claims 74, 83 and 97 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Nuber and/or Pearce as applied to Claims 72, 81 and 91 above, and further in view of Thome (US Patent 5,744,190). (FOA at page 9) Claims 73, 83 and 97 depend from and recite the same limitations as independent Claims 72, 81 and 91 respectively. Thome shows floor mounted painting robots connected to controllers. Thome does not show the elements missing from the independent Claims 72, 81 and 91 as explained above.

The rejection of Claims 75, 88 and 96 under 35 U.S.C. 103(a):

The Examiner rejected Claims 75, 88 and 96 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thorne as applied to Claims 72, 81 and 91 above, and further in view of Cebola (US Patent 5,738,727). (FOA at page 9) Claims 75, 88 and 96 depend from and recite the same limitations as independent Claims 72, 81 and 91 respectively. Cebola shows a roof machine having paint sprayers connected to conduits and cables for coating product, air and electric current wherein the conduits and cables are housed in a beam carrying the sprayers. Cebola does not show the elements missing from the independent Claims 72, 81 and 91 as explained above.

The rejection of Claim 76 under 35 U.S.C. 103(a):

The Examiner rejected Claim 76 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thorne as applied to Claims 75 and 52 [sic] above, and further in view of Neikter (US Patent 5,296,026). Claim 76 depends from and recites the same limitations as independent Claim 72. Neikter shows painting "automatics" 5, 6 enclosed in flexible, gas-permeable material enclosures 12, 22. The enclosures 12, 22 are pressurized such that part of the air flows out to repel paint particles. Neikter does not show the elements missing from the independent Claim 75 as explained above.

The rejection of Claims 64 and 85 under 35 U.S.C. 103(a):

The Examiner rejected Claims 64 and 85 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 81 above, and further in view of Josefsson (US Patent 5,766,355). Claims 64 and 85 depend from and recite the same limitations as independent Claims 61 and 81 respectively. Josefsson shows a paint spray booth for the application of powder paint from fixed applicators 104a, 104b, 214, 314. Josefsson does not show the elements missing from the independent Claims 64 and 85 as explained above.

The rejection of Claims 66 and 68 under 35 U.S.C. 103(a):

The Examiner rejected Claims 66 and 68 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 67 above,

and further in view of Cebola (US Patent 5,738,727). Claims 66 and 68 depend from and recite the same limitations as independent Claim 61. Cebola does not show the elements missing from the independent Claim 61 as explained above.

The rejection of Claims 62, 84 and 93 under 35 U.S.C. 103(a):

The Examiner rejected Claims 62, 84 and 93 under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to Claims 61 and 81 above, and further in view of Hohn et al (US Patent 4,896,274). Claims 62, 84 and 93 depend from and recite the same limitations as independent Claims 61, 81 and 91 respectively. Hohn shows a robot with an adhesive material dispensing gun 120 mounted on a wrist 27 having three axes of motion. Hohn does not show the elements missing from the independent Claims 61 and 81 as explained above.

Declarations under 37 C.F.R. § 1.132:

On July 19, 2007, Applicant submitted four declarations under 37 C.F.R. § 1.132. On July 27, 2007, Applicant submitted an additional declaration under 37 C.F.R. § 1.132. These declarations are included in the Evidence Appendix. The Examiner failed to address the content of these declarations in the Final Office Action dated October 11, 2007, the Office Action dated January 11, 2008 and the Final Office Action dated June 30, 2008.

The declaration of the inventors, Messrs. Clifford and Copioli, provides the following information:


1. The background and disadvantages of prior art overhead painting machines and robotic painting systems (Declaration Attachment at pages 1-6);
2. The features and advantages of the modular apparatus recited in Applicant's claims (Declaration Attachment at pages 7-13); and
3. The market success of the modular apparatus recited in Applicant's claims (Declaration Attachment at pages 14-15).

The other declarations provide detailed information about the significant market impact of the claimed invention. Applicant requests that the Board consider these declarations in support of the nonobviousness of Applicant's Claims 61-101.

Conclusion:

For the foregoing reasons, Applicant respectfully submits that the claims on appeal each define subject matter which is not rendered obvious to one of ordinary skill in the art at the time the invention was made. Accordingly, all of the claims on appeal are believed to be entitled to allowance, and a favorable decision is courteously solicited.

Respectfully submitted,


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(viii) *Claims Appendix:*

The claims on Appeal read as follows:

Claims 1-60 canceled.

61. (Previously presented) A modular apparatus for painting surfaces of a vehicle body moved along a path comprising:

a modular apparatus including two guide rails; and

at least one robot located on and movable along the length of each of said two guide rails;

said guide rails comprising a pair of frame rails located on opposite sides of and extending generally parallel to the path of movement of the vehicle body, said frame rails being located above a plane of an upper surface of the vehicle body as the vehicle body travels the path, said frame rails being fixedly mounted on a rigid frame structure that prevents movement of one of said frame rails relative to another of said frame rails;

said at least one robot comprising a first and a second robot arm mounted on an associated one of each of said frame rails, each of said first and second robot arms being slidably movable along said associated frame rail and having a shoulder axis and an elbow axis for movement only in a generally vertical plane transverse to the path of movement of the vehicle body, said shoulder axes being positioned below said associated frame rail; and

a paint applicator mounted on each of said first and second robot arms for dispensing paint whereby each of said first and second robot arms is sized to move said paint applicator relative to the vehicle body while said paint applicators dispense paint to cover the upper surface and adjacent side surfaces of the vehicle body with the paint.

62. (Previously Presented) The apparatus according to Claim 61 wherein each of said first and second robot arms includes a wrist mounting said paint applicator, said wrist having a rotating axis and a tilting axis for moving said paint applicator relative to the vehicle body.

63. (Previously Presented) The apparatus according to Claim 61 wherein each of said first and second robot arms moves in a generally vertical plane transverse to the path of movement of the vehicle body to dispense the paint.

64. (Previously Presented) The apparatus according to Claim 61 wherein said frame rails are mounted on walls of a paint booth extending generally parallel to the path of movement of the vehicle body.

65. (Previously Presented) The apparatus according to Claim 61 wherein said frame rails are mounted on floor engaging legs.

66. (Previously Presented) The apparatus according to Claim 61 wherein said frame rails are tubular.

67. (Previously Presented) The apparatus according to Claim 61 wherein said frame rails are connected by at least one cross support member located above the plane of the upper surface of the vehicle body.

68. (Previously Presented) The apparatus according to Claim 67 wherein said frame rails and said at least one cross support member are tubular.

69. (Previously Presented) The apparatus according to Claim 61 including control means maintaining said first and second robot arms in opposition to provide symmetric painting of the vehicle body.

70. (Previously Presented) The apparatus according to Claim 61 wherein each said shoulder axis extends parallel to and is offset horizontally from an axis of travel along said associated frame rail.

71. (Previously Presented) The apparatus according to Claim 61 wherein each said shoulder axis extends parallel to and is offset horizontally from an axis of travel along said associated frame rail toward the path of movement of the vehicle body.

72. (Previously presented) A modular apparatus for painting a vehicle body having an upper surface and opposed side surfaces and being conveyed along a path comprising:

a modular apparatus including two guide rails; and

at least one robot located on and movable along the length of each of said two guide rails;

said guide rails comprising a pair of frame rails extending along opposite sides of and generally parallel to the path of conveyance of the vehicle body;

at least two legs attached to each said frame rail for supporting said frame rails above a plane of the upper surface of the vehicle body on the path;

at least one cross member fixedly connecting said frame rails together as a rigid frame structure that prevents movement of said frame rails, fixes said frame rails relative to one another and to said plane, and minimizes a width of said rigid frame structure relative to a width of the vehicle body;

said at least one robot comprising at least one robot arm located on an associated one of each of said frame rails, said at least one robot arm being movable along said associated frame rail generally parallel to the path and being pivoted at a shoulder axis positioned below said associated frame rail; and

a paint applicator mounted on each said at least one robot arm for applying paint to the vehicle body whereby each of said at least one robot arms pivots at said shoulder in a generally vertical plane to permit each of said at least one robot arms to reach said paint applicator to all paintable areas on the upper surface and an adjacent one of the side surfaces of the vehicle body.

73. (Previously Presented) The apparatus according to Claim 72 wherein each of said at least one robot arm has an inner arm portion pivoted at one end at said shoulder axis and pivotally connected at an opposite end to an outer arm portion at an elbow axis.

74. (Previously Presented) The apparatus according to Claim 72 wherein each said at least one robot arm includes a process controller mounted for movement therewith along said associated frame rail.

75. (Previously Presented) The apparatus according to Claim 74 wherein said at least one cross support member is hollow and receives cables and conduits connecting said process controllers together.

76. (Previously Presented) The apparatus according to Claim 74 wherein said at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

77. (Previously Presented) The apparatus according to Claim 72 wherein each said at least one robot arm includes a wrist connecting a free end of said at least one robot arm and said paint applicator, said wrist having two axes of motion.

78. (Previously Presented) The apparatus according to Claim 72 wherein each said at least one robot arm has only four axes of motion including said shoulder axis for orienting said paint applicator relative to the vehicle body.

79. (Previously Presented) The apparatus according to Claim 72 wherein each said shoulder axis extends parallel to and is offset horizontally from an axis of travel along said associated frame rail.

80. (Previously Presented) The apparatus according to Claim 72 wherein each said shoulder axis extends parallel to and is offset horizontally from an axis of travel along said associated frame rail toward the path.

81. (Previously presented) A modular apparatus for painting surfaces of a vehicle body moved along a path through a paint booth comprising:

a modular apparatus comprising at least one horizontally extending guide rail; and
at least one robot arm including a controller mounted on said rail for travelling along said rail; wherein said guide rail comprises a pair of frame rails mounted on opposite sides of and extending generally parallel to the path of movement of the vehicle body through the paint booth, said frame rails being fixedly located above a plane of an upper surface of the vehicle body as the vehicle body travels the path; and

said at least one robot comprises a first and a second robot arm mounted on an associated one of each of said frame rails, each of said first and second robot arms being movable along said associated frame rail and having a shoulder axis and an elbow axis for movement only in a generally vertical plane transverse to the path of movement of the vehicle body, said shoulder axes being positioned below said associated frame rail; and

a paint applicator mounted on each of said first and second robot arms for
dispensing paint whereby said first and second robot arms are sized to
move said paint applicators relative to the vehicle body while said paint
applicators dispense paint to cover the upper surface and an adjacent side
surface of the vehicle body with the paint;

wherein said control means is connected to each of said first and second robot
arms for selectively dispensing the paint in a normal mode wherein
different areas of the upper surface and the adjacent side surface are
covered by said paint applicators of each of said first and second robot
arms and a degraded mode wherein the upper surface and the adjacent side
surface are covered by said paint applicator of one of said first and second
robot arms.

82. (Previously Presented) The apparatus according to Claim 81 wherein said first robot arms are positioned in opposition and said second robot arms are positioned in opposition to provide symmetric painting of the vehicle body.

83. (Previously Presented) The apparatus according to Claim 81 wherein said control means includes a separate process controller mounted on an associated one of each of said first and second robot arms for movement along said associated frame rail, each said process controller operating said associated robot arm in the normal mode and the degraded mode.

84. (Previously Presented) The apparatus according to Claim 81 wherein each of said first and second robot arms includes a wrist mounting said paint applicator, said wrist having a rotating axis and a tilting axis for moving said paint applicator relative to the vehicle body.

85. (Previously Presented) The apparatus according to Claim 81 wherein said frame rails are mounted on walls of a paint booth extending generally parallel to the path of movement of the vehicle body.

86. (Previously Presented) The apparatus according to Claim 81 wherein said frame rails are mounted on floor engaging legs.

87. (Previously Presented) The apparatus according to Claim 86 wherein frame rails are connected by at least one cross support member located above the plane of the upper surface of the vehicle.

88. (Previously Presented) The apparatus according to Claim 87 wherein said frame rails and said at least one cross support member are tubular and receive cables and conduits connecting said first and second robot arms together.

89. (Previously Presented) The apparatus according to Claim 81 wherein each of said first and second robot arms has four axes of movement including said shoulder axis and an elbow axis defining a planar operating space for said paint applicator transverse to the path of movement of the vehicle body and including a wrist rotating axis and a wrist tilting axis for moving said paint applicator.

90. (Previously presented) A modular apparatus for painting surfaces of a vehicle body moved along a path comprising:

a modular system including two guide rails; and

at least one robot located on and movable along the length of each of said two guide rails;

said guide rails further comprising a pair of frame rails located on opposite sides of and extending generally parallel to the path of movement of the vehicle body, said frame rails being elevated above a plane of an upper surface of the vehicle body as the vehicle body travels the path, said frame rails being mounted on a fixed rigid frame structure that prevents movement of one of said frame rails relative to another of said frame rails, and prevents movement of said frame rails relative to said plane; and

a first and a second robot arm mounted on an associated one of each of said frame rails, each of said first and second robot arms having a carriage movable along an associated one of said frame rails, first and second arm links, and mounting means for mounting a paint applicator at an end of said second arm link, three parallel axes of movement including a first linear axis wherein said carriages move along said associated frame rails, a second rotational axis located below said first linear axis for rotating said first arm link relative to said carriage and a third rotational axis spatially separated from said second rotational axis by said first arm link for rotating said second arm link relative to said first arm link whereby movement of a paint applicator attached to said mounting means is restricted to a generally vertical plane transverse to the path of movement of the vehicle body and movement along the path of movement of the vehicle body;

said robot arms further comprising a paint applicator mounted on each of said first and second robot arms for dispensing paint whereby each of said first and second robot arms is sized to move said paint applicator relative to the vehicle body while said paint applicators dispense paint to cover the upper surface and adjacent side surfaces of the vehicle body with the paint.

91. (Previously presented) A modular apparatus for processing an article moved along a path comprising:

a modular system including two guide rails; and

at least one robot located on and movable along the length of each of said two guide rails; said robot including a control system;

said robot having six axes of motion and being connected to said control system for controlling movement of said robot,

said modular system having a frame structure including first and second linear and parallel guide rails, a first carriage supported on said first guide rail and movable along a first of said six axes and a second carriage supported on said second guide rail and movable along a second of said six axes, a first arm link rotationally coupled at one end to said first carriage at a third of said six axes and rotationally coupled at another end to a second arm link at a fourth of said six axes, a third arm link rotationally coupled at one end to said second carriage at a fifth of said six axes and rotationally coupled at another end to a fourth arm link at a sixth of said six axes, and process tool mounting means supported at terminal ends of said second and fourth arm links, wherein said first and second guide rails are elevated above the article on opposite sides of the path and said six axes are parallel to the path.

92. (Previously presented) The apparatus according to Claim 91 wherein said third and fifth axes are located below said first and second guide rails and above a top surface of the article and wherein said first through fourth axes are fixed in space relative to one another as said robot performs process operations on the article.

93. (Previously presented) The apparatus according to Claim 91 wherein said mounting means is a robotic wrist mechanism having at least one rotational axis for providing directional orientation to a process tool mounted on said wrist mechanism.

94. (Previously presented) The apparatus according to Claim 91 including a paint applicator mounted on each of said mounting means and wherein the article is a vehicle body to be painted.

95. (Previously presented) The apparatus according to Claim 94 wherein the first and second arm links are sized to move said paint applicator relative to the vehicle body while said paint applicator dispenses paint to cover an upper surface and adjacent sides of the vehicle body with the paint.

96. (Previously presented) The apparatus according to Claim 91 wherein said frame structure has at least one hollow beam member.

97. (Previously presented) The apparatus according to Claim 91 wherein said control system is mounted in at least one of said carriages and is movable along an associated one of said first and second guide rails.

98. (Previously presented) A robot for processing an article moved along a path comprising:

- a modular system including two guide rails; and

- at least one robot located on and movable along the length of each of said two guide rails; said robot including a control system conjoined with and movable with said robot; and

- wherein said guide rails form a robot base including a frame structure having linear and parallel first and second guide rails;

- a first carriage supported on said first guide rail and movable along a first axis;

a second carriage supported on said second guide rail and movable along a second axis;
a first link mechanism rotationally coupled to said first carriage at a third axis;
a second link mechanism rotationally coupled to said second carriage at a fourth axis; and
a process tool mounting means supported at terminal ends of said first and second link mechanisms, wherein said guide rails are fixed and said modular system is elevated above the article on opposite sides of the path.

99. (Previously presented) The robot according to Claim 98 wherein each of said guide rails supports at least another of said carriages and link mechanisms.

100. (Previously presented) The robot according to Claim 98 wherein said process tool mounting means includes a multiple axis wrist mechanism controlled by said control system.

101. (Previously presented) The robot according to Claim 98 wherein said first and second link mechanisms include fifth and sixth axes of rotation respectively and said first through sixth axes each extend in a substantially horizontal orientation.

102. (New) A modular apparatus for performing a coating process on an object conveyed to and from a location comprising:

a pair of horizontal frame rails extending on opposite sides of a location of an object;
at least one robot arm mounted on an associated one of each of said frame rails, said robot arm movable along said associated frame rail in a linear manner, said at least one robot arm comprising at least one rotating arm linkage and not having a waist axis; and
a tool mounted on each of said at least one robot arms for performing a coating process on the object whereby said at least one robot arms move said tools

relative to the object enabling said tools to perform the coating process on the object.

103. (Withdrawn) The apparatus according to Claim 102 wherein said pair of frame rails further comprises at least two legs attached to each of said frame rails for elevating said frame rails above a plane of an upper surface of the object at the location.

104. (Withdrawn) The apparatus according to Claim 103 wherein said pair of frame rails and said two legs further comprise at least one cross support member connecting said frame rails together to form a rigid frame structure with said legs.

105. (Withdrawn) The apparatus according to Claim 102 wherein each said at least one robot arm extends to reach said tool mounted thereon to all exterior surfaces on a front, rear, top, and near side of the object.

106. (Withdrawn) The apparatus according to Claim 102 wherein each said at least one robot arm includes a process controller mounted for movement therewith along said associated frame rail.

107. (Withdrawn) The apparatus according to Claim 104 wherein said at least one cross support member is hollow for receiving cables and conduits.

108. (Withdrawn) The apparatus according to Claim 105 wherein said at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

109. (Withdrawn) The apparatus according to Claim 102 wherein each said at least one robot arm includes two axes of motion defining a generally vertical planar operating space of said at least one robot arm.

110. (Withdrawn) The apparatus according to Claim 102 wherein each said at least one robot arm includes a wrist connected between a free end of said at least one robot arm and said tool, said wrist having at least two axes of motion.

111. (Withdrawn) The apparatus according to Claim 102 wherein each said at least one robot arm includes five axes of motion for orienting said tool relative to the object.

112. (Withdrawn) The apparatus according to Claim 111 wherein the five axes of motion comprise a first horizontal linear axis formed by the rail, a second shoulder rotary axis, a third elbow rotary axis, and a wrist having a fourth and fifth axis.

113. (Withdrawn) The apparatus according to Claim 102 wherein said frame rails are mounted on walls of a coating booth extending generally parallel to a path of movement of the object.

114. (Withdrawn) The apparatus according to Claim 102 wherein said frame rails are mounted on floor engaging legs.

115. (Withdrawn) A modular apparatus for performing a coating process on an object conveyed to and from a location comprising:

- a pair of horizontal frame rails extending on opposite sides of a location of an object, said frame rails being elevated above an upper surface of the object;
- at least one robot arm mounted on an associated one of each of said frame rails, said robot arm movable along said associated frame rail in a linear manner said at least one robot arm not having a waist axis; and
- a tool mounted on each of said at least one robot arms for performing a coating process on the object whereby said at least one robot arms move said tools relative to the object enabling said tools to perform the coating process on the object.

116. (Withdrawn) The apparatus according to Claim 115 wherein said pair of frame rails further comprises two legs and at least one cross support member connecting said frame rails together to form a rigid frame structure with said legs.

117. (Withdrawn) The apparatus according to Claim 115 wherein each said at least one robot arm extends to reach said tool mounted thereon to all exterior surfaces on a front, rear, top, and near side of the object.

118. (Withdrawn) The apparatus according to Claim 115 wherein each said at least one robot arm includes a process controller mounted for movement therewith along said associated frame rail.

119. (Withdrawn) The apparatus according to Claim 116 wherein said at least one cross support member is hollow for receiving cables and conduits.

120. (Withdrawn) The apparatus according to Claim 116 wherein said at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

121. (Withdrawn) The apparatus according to Claim 115 wherein each said at least one robot arm includes two axes of motion defining a generally vertical planar operating space of said at least one robot arm.

122. (Withdrawn) The apparatus according to Claim 115 wherein each said at least one robot arm includes a wrist connected between a free end of said at least one robot arm and said tool, said wrist having at least two axes of motion.

123. (Withdrawn) The apparatus according to Claim 115 wherein each said at least one robot arm includes five axes of motion for orienting said tool relative to the object.

124. (Withdrawn) The apparatus according to Claim 123 wherein the five axes of motion comprise a first horizontal linear axis formed by the rail, a second shoulder rotary axis, a third elbow rotary axis, and wrist having a fourth and fifth.

125. (Withdrawn) The apparatus according to Claim 115 wherein said frame rails are mounted on walls of a coating booth extending generally parallel to a path of movement of the object.

126. (Withdrawn) The apparatus according to Claim 115 wherein said frame rails are mounted on floor engaging legs.

127. (Withdrawn) A modular apparatus for performing a coating process on an object conveyed to and from a location comprising:

a pair of horizontal frame rails extending on opposite sides of a location of an object;

at least one robot arm mounted on an associated one of each of said frame rails, said robot arm movable along said associated frame rail in a linear manner said at least one robot arm having at least a first, second, and third major axes of movement wherein said first major axis is linear, said second major axis is a rotary axis extending in a horizontal plane, and said third major axis is a rotary axis extending in a horizontal plane; and

a tool mounted on each of said at least one robot arms for performing a coating process on the object whereby said at least one robot arms move said tools relative to the object enabling said tools to perform the coating process on the object.

128. (Withdrawn) The apparatus according to Claim 127 wherein said pair of frame rails further comprises at least two legs attached to each of said frame rails for elevating said frame rails above a plane of an upper surface of the object at the location.

129. (Withdrawn) The apparatus according to Claim 128 wherein said pair of frame rails and said two legs further comprise at least one cross support member connecting said frame rails together to form a rigid frame structure with said legs.

130. (Withdrawn) The apparatus according to Claim 127 wherein each said at least one robot arm extends to reach said tool mounted thereon to all exterior surfaces on a front, rear, top, and near side of the object.

131. (Withdrawn) The apparatus according to Claim 127 wherein each said at least one robot arm includes a process controller mounted for movement therewith along said associated frame rail.

132. (Withdrawn) The apparatus according to Claim 129 wherein said at least one cross support member is hollow for receiving cables and conduits.

133. (Withdrawn) The apparatus according to Claim 129 wherein said at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

134. (Withdrawn) The apparatus according to Claim 127 wherein each said at least one robot arm includes two axes of motion defining a generally vertical planar operating space of said at least one robot arm.

135. (Withdrawn) The apparatus according to Claim 127 wherein each said at least one robot arm includes a wrist connected between a free end of said at least one robot arm and said tool, said wrist having at least two axes of motion.

136. (Withdrawn) The apparatus according to Claim 127 wherein each said at least one robot arm includes five axes of motion for orienting said tool relative to the object.

137. (Withdrawn) The apparatus according to Claim 136 wherein the five axes of motion comprise a first horizontal linear axis formed by the rail, a second shoulder rotary axis, a third elbow rotary axis, and a wrist having a fourth and fifth axis.

138. (Withdrawn) The apparatus according to Claim 127 wherein said frame rails are mounted on walls of a coating booth extending generally parallel to a path of movement of the object.

139. (Withdrawn) The apparatus according to Claim 127 wherein said frame rails are mounted on floor engaging legs.

140. (Withdrawn) A modular apparatus for performing a coating process on an object conveyed to and from a location comprising:

a pair of horizontal frame rails extending on opposite sides of a location of an object, said frame rails being elevated above an upper surface of the object;

at least one robot arm mounted on an associated one of each of said frame rails, said robot arm movable along said associated frame rail in a linear manner said at least one robot arm having at least a first, second and third major axes of movement wherein said first major axis is linear, said second major axis is a rotary axis extending in a horizontal plane, and said third major axis is a rotary axis extending in a horizontal plane; and

a tool mounted on each of said at least one robot arms for performing a coating process on the object whereby said at least one robot arms move said tools relative to the object enabling said tools to perform the coating process on the object.

141. (Withdrawn) The apparatus according to Claim 140 wherein said pair of frame rails further comprises two legs and at least one cross support member connecting said frame rails together to form a rigid frame structure with said legs.

142. (Withdrawn) The apparatus according to Claim 140 wherein each said at least one robot arm extends to reach said tool mounted thereon to all exterior surfaces on a front, rear, top, and near side of the object.

143. (Withdrawn) The apparatus according to Claim 140 wherein each said at least one robot arm includes a process controller mounted for movement therewith along said associated frame rail.

144. (Withdrawn) The apparatus according to Claim 141 wherein said at least one cross support member is hollow for receiving cables and conduits.

145. (Withdrawn) The apparatus according to Claim 141 wherein said at least one cross support member is tubular and purged with an inert gas or air for explosion protection.

146. (Withdrawn) The apparatus according to Claim 140 wherein each said at least one robot arm includes two axes of motion defining a generally vertical planar operating space of said at least one robot arm.

147. (Withdrawn) The apparatus according to Claim 140 wherein each said at least one robot arm includes a wrist connected between a free end of said at least one robot arm and said tool, said wrist having at least two axes of motion.

148. (Withdrawn) The apparatus according to Claim 140 wherein each said at least one robot arm includes five axes of motion for orienting said tool relative to the object.

149. (Withdrawn) The apparatus according to Claim 148 wherein the five axes of motion comprise a first horizontal linear axis formed by the rail, a second shoulder rotary axis, a third elbow rotary axis, and a wrist having a fourth and fifth axis.

150. (Withdrawn) The apparatus according to Claim 140 wherein said frame rails are mounted on walls of a coating booth extending generally parallel to a path of movement of the object.

151. (Withdrawn) The apparatus according to Claim 140 wherein said frame rails are mounted on floor engaging legs.

(ix) *Evidence Appendix:*

1. Declaration of Scott J. Clifford and Paul Cipioli Under 37 CFR 1.132.
2. Declaration of Douglas A. Frank Under 37 CFR 1.132.
3. Declaration of Edward J. Minch Under 37 CFR 1.132.
4. Declaration of Rob Kuphal Under 37 CFR 1.132.
5. Declaration of Martin D. Rola Under 37 CFR 1.132.